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ABSTRACT

The Micro-TOWER System of Vocational Evaluation was developed in response to the need for a revision of the TOWER (Testing, Orientation, and Work Evaluation in Rehabilitation) System. The Micro-TOWER system of work sample tests measures the major aptitudes required for most semi-skilled and unskilled occupations. It may be used as a screening device, preceding more extensive evaluation. A variety of general vocational aptitudes are measured--verbal, numerical, motor, spatial, and clerical perception skills. These skills were originally chosen to parallel the Dictionary of Occupational Titles aptitudes, and include message taking, making change, bottle capping and packing, lamp assembly, blueprint reading, and mail sorting. The system has been field tested on a variety of populations, and is suitable for the physically handicapped, emotionally disturbed, and Spanish-speaking. Separate norms are available for a number of different groups. The test is administered, using a tape recorder, to a group of approximately five to ten clients at one time. At the beginning of each work sample, occupational information is presented. Procedures for test administration, test use, interpretation of results, and related technical studies are described. (GDC)

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The Development of Micro-TOWER: A Battery of Standardized Work Samples for Assessing Vocational Aptitudes

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Micro-TOWER has been described in several papers and articles, including one prepared by Roland P. Piller in the Vocational and Work Adjustment Bulletin (Vol. 9, No. 4, December 1976). A slide presentation describing the system is also available from the ICD Rehabilitation and Research Center in New York City. The Materials and Development Center of the University of Wisconsin-Stout will also be preparing a slide presentation on Micro-TOWER shortly. More detailed information is included in the three manuals that accompany the Micro-TOWER work samples: The General Manual for Administration and Scoring, The Technical Manual, and the Manual for the Group Discussion Program.

This paper is not simply a reiteration of what has been published before; it is intended to provide an elaboration and discussion of some of the more interesting and unique aspects of the system. Of course, it will be necessary to briefly describe the various features of the system for those persons who have not had previous exposure to Micro-TOWER.

HISTORY AND DEVELOPMENT

The development of any major test or work sample system involves extensive planning and tryouts. Even with this there are occasionally false leads and new starts. A great deal of specialized knowledge, staff time, and money are required every step of the way. The new Micro-TOWER system of vocational evaluation would not be immune to any of these demands.

Micro-TOWER was developed at the ICD Rehabilitation and Research Center in New York City. ICD, formerly known as the Institute for the Crippled and Disabled, was one of the pioneers in the development and use of work samples in vocational rehabilitation. As long ago as 1935, staff at ICD were developing work samples. These work samples were the forerunners of those that in the 1950's became part of the TOWER system , an acronym for Testing, Orientation and Work Evauation in Rehabilitation. To this day the TOWER system is used in rehabilitation centers throughout the United States, as well as in many countries around the world.

In the early 1970's, a decision was made at ICD to develop a new system of work samples to meet today's needs. The new system was to take less than a week to administer, as compared to the more extensive four to five weeks required by TOWER. At first the idea was simply to revise some of the most useful of the 94 TOWER work samples. It soon became evident that it would be best to develop an entirely new system of evaluation.

The new system would still make use of the work sample approach, but would incorporate the latest psychometric techniques to improve the efficiency, accuracy, and objectivity of the evaluation. Many of these techniques had been developed and used in the field of education, but had yet to be

adapted for work sample assessment in rehabilitation.

At this point it was decided to develop a set of work samples that directly paralled the tests of the Department of Labor's General Aptitude Test Battery (GATB). This also proved infeasible. One reason such an approach does not work is that paper and pencil tests, such as those comprising most of the GATB, require different kinds of abilities than do work samples. Also, work samples measure a more complex interaction of skills, resembling to a larger extent real work tasks. In addition, the GATB was too difficult for most of the clients evaluated at rehabilitation centers. This factor tended to reduce the size of the correlation coefficients between Micro-TOWER work samples and the GATB, making interpretation of statistical data difficult, if not impossible.

Finally a decision was made to develop an independent aptitude battery, covering major aptitudes required for most semi-skilled and unskilled jobs. The new system, called MICRO-TOWER, would supplement TOWER and the other evaluation systems that were coming onto the market. The Micro-TOWER system could be used alone, or as a screening device for further, more extensive evaluation with work samples or paper and pencil tests.

Aptitude Areas Measured

Whereas the original TOWER work samples were based on job analysis and assessed skills for specific jobs, Micro-TOWER provides an overall aptitude profile. This profile shows a client's strengths and weaknesses in given aptitude areas. This approach allows Micro-TOWER to be used in a variety of geographic areas with different job opportunities, as well as in a variety of settings serving persons with differing abilities and needs. The aptitude approach also provides flexibility in an ever changing job market where specific job opportunities may change but the skills required for broad classifications for work remain the same.

The aptitudes to be assessed by Micro-TOWER were originally based on the aptitude definitions provided by the Dictionary of Occupational Titles (DOT). Each work sample was to measure primarily one of the DOT aptitudes, although it was recognized that a combination of skills would be required. This is one of the advantages and disadvantages of work samples for assessment.

Preliminary Work.

Examination of intercorrelations of GATB scores had revealed five major aptitude clusters. These same five areas were to form the basis of the Micro-TOWER aptitude profile: Verbal, Numerical, Motor, Perceptual, and Perceptual-Motor.

Within these areas a number of work samples were developed; not all of them survived the intensive scrutiny and standards set up for acceptance into the battery: ease of administration, ease of scoring, appropriate difficulty, and appropriateness for group administration. The first work samples to be developed were based on some of the TOWER materials; however, in order to adapt the work samples for group administration, it was necessary to change the administration and scoring procedure.

Those included in this first group were Bottle Capping and Packing, Graphics Illustration (Drafting), and Blueprint Reading. Although these work samples make use of some of the TOWER materials, the adaptations and revisions led to essentially different work samples from their forerunners in TOWER.

Other work samples were added to cover the aptitudes listed in the DOT. Content and materials were as up to date as possible giving the work samples face validity for today's job market. For example, a computer printed inventory list is used for assessing perceptual speed and accuracy; electronic connectors are used for pin insertion to measure finger dexterity.

The Present Battery.

A subsequent factor analysis led to the reorganization of the work samples into these five areas: Verbal, Numerical, Motor, Spatial and Clerical Perception.

Verbal

Want Ads Comprehension - Clients read newspaper classified ads and answer questions about the content of the ads.

Message Taking - Clients listen to simulated phone calls to a coffee shop, and take brief messages and food orders on standard forms.

These verbal tasks were not intended to duplicate standardized reading tests that are readily available. Want Ads serve as a screening test for basic English comprehension. Message Taking measures verbal skills not commonly assessed by paper and pencil tests.

Numerical

Payroll Computation - Clients complete several weekly work records for piece work in a factory, using addition, subtraction, multiplication, and division of whole numbers and decimals. An optional task involving simple counting is available for lower functioning clients.

Making Change - Clients act as clerks making change for purchases in a toy store; an optional evaluation involving only the counting of money is available for lower functioning clients.

Motor

Bottle Capping and Packing - Clients screw caps onto bottles and stack the bottles in a carton as in a workshop, assembly setting.

Motor (continued)

Electronic Connector Assembly-Clients place small pins and spring clips into electronic connectors, as in an assembly line in an electronics factory.

Lamp Assembly-Clients assemble a working table lamp using a screwdriver, needlenosed plier, and a wire stripper.

Spatial

Blueprint Reading-Clients determine the lengths of various surfaces on a three-dimensional drawing of a machine part by referring to two-dimensional drawings.

Graphics Illustration-Clients reproduce designs using a compass, T-square, and a triangle.

Clerical Perception

Mail Sorting-Clients use a personnel roster to assist in sorting addressed envelopes into a company mail box.

Filing-Clients file index cards for an insurance company using both alphabetical and numerical sequences.

Zip Coding-Clients look up zip codes in a directory for addresses from a list from a mail order house. This work sample has a component of general learning ability and includes an optional, more complex, task for higher functioning clients.

Record Checking-Clients compare a computer printed inventory list to a working inventory list from a shoe store. Discrepancies are noted.

Tryouts and Field Testing

Each work sample was tried out over a period of two years or more at ICD. Item analysis statistics were computed where feasible and tasks were refined to keep the difficulty levels suitable for the population being tested. In addition to statistical considerations, clients were asked to evaluate the work samples and make suggestions for change. These suggestions were examined and implemented whenever they were judged to be valid and practical.

Following the original tryouts at ICD, Micro-TOWER was field tested in 1976 at 18 separate sites in the United States. This field testing was in part supported by a grant from the Rehabilitation Services Administration, of the Department of Health, Education, and Welfare. The field sites included rehabilitation facilities, psychiatric hospitals, correctional facilities, and a school for the mentally retarded.

The Group Approach

Unlike other work sample systems, Micro-TOWER was designed to be administered to small groups. Typically a group consists of from five to ten persons, although larger groups are possible depending upon factors, such as level of functioning of the clients and types of disabilities. My experience at ICD and in field testing are that clients generally respond well to being evaluated in a group; they form a supportive social unit that is beneficial to them throughout their stay at the agency.

Standardization

In Micro-TOWER everyone takes the same work sample at the same time. Administration and scoring procedures are standardized. This means that all clients receive the same instructions no matter who administers the work sample; results are also objectively scored, providing reliable scores that are not dependent upon the particular personality or background of the evaluator.

Forms are provided for behavioral observations, so that evaluators can make notes on client behaviors. These notes are to be based as much as possible on actual, observed behavior.

As part of the standardization, the instructions to the clients are presented by a taped voice. This assures that all clients receive the same basic instructions and frees the evaluator to move around the room to observe and help clients. The taped instructions also eliminate the need for clients to read instructions, something which could adversely affect their scores if they were poor readers.

Seven of the work samples have a male voice on the tape, and six a female voice. The female voice is used for those work samples that resemble jobs typically held by males, and vice versa. This was done to overcome some of the resistance to work samples where strong sex role identification might exist.

Some persons not personally familiar with Micro-TOWER sometimes raise the question about the possible impersonality of the tape player. Since the evaluator is always in the room, Micro-TOWER provides as much as or more personal attention than do individual work samples where clients only interact periodically with the evaluator. Also, in Micro-TOWER, the evaluator is free to stop the tape recorder any time during the learning period to help the clients.

Clients of today are quite used to technical and electronic equipment. In fact when Micro-TOWER was in the early stages of development and instructions were read, some would actually ask "Why don't you use a tape recorder so you won't have to read those instructions all the time."

Presentations of Occupational Information

At the beginning of each work sample, clients are shown large photos of persons working in specific jobs. The jobs cover a wide range of occupations, illustrating that seemingly unrelated jobs can require similiar skills. One reason for this approach is to discourage clients from thinking that a given work sample is assessing their skills for only one job; the emphasis is on aptitudes, not the specific job task on hand. Workers in the photos come from different ethnic groups, and cover a range of ages. Attempts were made to show men and women in nontraditional work roles. Again, as with the male and female voices on the tapes, this is to encourage clients to consider jobs they might otherwise not have considered.

Learning and Evaluation Periods

Each work sample is divided into a learning/practice period and an evaluation period. During the learning period the evaluator may stop the tape at any time to assist clients and to answer questions. A cue-stop cassette player is provided with the Micro-TOWER system. Based on experience during the tryouts, each tape was designed to stop automatically at certain places to enable the evaluator to help clients. The evaluator may also stop the tape to answer questions or to provide needed assistance.

During the evaluation period no help is allowed. Clients are told to do the best they can. For most of the work samples, the learning period is three times as long as the evaluation period.

Two equivalent forms of the work samples are available for Zip Coding, Blueprint Reading, Payroll Computation and Want Ads Comprehension. This is to reduce the possibility of copying by providing alternate forms to clients sitting beside each other. These alternate forms can also be used should it be necessary to retest a client. The results of test-retest studies indicate that client performance does not increase significantly upon re-testing. Specific training between testings, however, might affect such results.

Group Discussion Techniques

At the end of each day a group discussion is held. This discussion is usually conducted by the evaluator who has been administering the work samples. This provides an additional opportunity for the evaluator to observe clients and to gain a better understanding of their behavior and motivation. A counselor may lead the discussion if this is the preference at a given agency.

The particular form the group discussion takes will depend upon the clients, i.e., their disabilities and whether or not they have known each other previously. A manual for the group discussion program is provided with the Micro-TOWER work samples. This manual describes a series of discussion exercises that can be used by a person with limited training with groups. The techniques include simple methods or games for having people introduce themselves to the group, useful on the first day if the clients are strangers. Other techniques deal with personal motivations and vocational goals.

One group technique that is used on the last day of evaluation is a feedback of results. Special forms are provided so that clients can see the areas where they are weak and strong. No actual scores are given, only relative strengths and weaknesses on a profile sheet. This technique has proved quite useful as a way of involving clients in their own evaluation. This exercise also increases involvement in the entire evaluation process, especially when clients are told they will receive feedback on their performance. The group situation provides a supportive environment for clients to receive such feedback.

USE OF RESULTS

The way the results are used to some extent depends upon the placement options available at a particular agency and the kinds of clients served.

The Micro-TOWER work samples provide a profile of scores in the five major aptitude areas: Verbal, Numerical, Motor, Spatial, and Clerical Perception. Separate norms tables are provided so that the level of a client's functioning can be compared to an appropriate reference group. Since Micro-TOWER is usually used as a screening device for further evaluation or placement in a training program, client norms can appropriately be used at this point in time. Most clients in the beginning stages of evaluation or training would score far below successful workers on the job; thus, on-the-job norms would not be appropriate for decision making at this point in time.

Those clients who score at the top of the range are usually recommended for further evaluation with more difficult work samples or tests, or they are given job training. Those in the lower ranges can be given skills training, or they can be tested with a less difficult instrument, such as VIEWS.

For counselors and evaluators who prefer to use the DOT, Micro-TOWER provides two possibilities. The Micro-TOWER General Manual includes a listing of jobs from the DOT. These jobs are classified according to the combination of aptitudes required. Secondly, through correlations with the GATB, Micro-TOWER scores can be used to estimate DOT aptitude levels; this provides an indication of applicable worker trait groups. A table for estimating these aptitude levels is given in the Technical Manual.

A third approach that is being developed, will involve a computer printout of worker trait groups based on client scores on Micro-TOWER. This should be available in the not too distant future.

It should be noted that these methods only provide estimates of the kinds of jobs or worker-trait groups that might be suitable for a client. None are based on actual job analysis or predictive validity studies in a particular job setting. These methods are offered only as rough guides for the counselor. Other data and information on the client, including client interests and available job opportunities must be taken into account.

FOR WHAT GROUPS CAN MICRO-TOWER BE USED?

Micro-TOWER was originally developed at a rehabilitation center that served the physically disabled and psychiatrically disturbed. Clients ranged from their late teens to early 60's; the average age was late 20's. However, as a result of the national field testing, norms are available for a wide variety of clients: the brain damaged, the educable mentally retarded, ex-drug abusers, ex-alcoholics, adult offenders, the socio-economically disadvantaged, the physically disabled, and the psychiatrically disturbed. Separate norms are also available for males and females, and the Spanish-speaking.

In addition, Micro-TOWER is presently being used for assessing aptitudes of junior high school students in special education in the New York City school system, and with high school students in special education in the Washington, D.C. school system.

One of the major benefits of Micro-TOWER with these students is that the students themselves enjoy taking the work samples and do not see them as tests. Testing brain injured, neurologically impaired, and retarded students has always posed some difficulty, particularly one of motivation and involvement in the task. The group situation, the evaluator's constant supportive presence, and the attractiveness of the equipment seem to have a very positive effect.

Micro-TOWER is also being used by the New York Association for the Blind (The Lighthouse) to assess the vocational skills of the visually handicapped. So far those with limited sight (8/200 or more) have been able to use the Micro-TOWER work samples with little or no modification.

Micro-TOWER is not suitable with the totally blind. Some of the work samples have been tried out with the deaf, using a combination of demonstration and sign language. The results at present are mixed, but studies are continuing.

None of the work samples require that a client stand; but, the use of one hand is necessary. For taped instructions an understanding of spoken English is useful. However, since demonstration as well as verbal instructions are used, many clients are able to take the work samples with little or no facility in English. This is particularly true of the work samples in the motor skills area. For work samples involving some reading, preliminary analysis of data indicates that a third to fourth grade reading level should be adequate.

Scheduling.

The general manual provides suggested schedules for administering Micro-TOWER work samples. At ICD Micro-TOWER is given the first week clients are at the agency; the client day begins at 9 and ends at 3; group discussions are held the last 30 to 60 minutes of each day. The sample schedules, however, illustrate a wide variety of options, ranging from a two day to a two week testing schedule, mornings only. All work samples need not be given, but to obtain a reliable client profile the entire 13 should be used. Discussion sessions are optional, but are encouraged as they provide important supplemental information and help to involve the clients in their own evaluation.

The work samples may be given in any order, although Want Ads Comprehension is usually given first to identify those with difficulties in English. Those persons may then be taken from the group or given special help during the learning period. The order of presentation of work samples is dependent upon such factors as how long a given work sample may run: The administration times run from 20 minutes for Bottle Capping and Packing to 2 3/4 hrs. for Lamp Assembly; most, however, take about one hour. The total time for all work samples is 14 1/2 hours. With breaks and discussion groups a complete evaluation usually takes 20-25 hours.

EVALUATOR QUALIFICATIONS AND TESTING

Effort was expended in the development of the Micro-TOWER system to provide all information necessary for proper administration and scoring. This resulted in an instrument that may be used without the evaluator having formal training. The evaluator or the evaluator's supervisor should have completed an advanced level course in testing in a university, or its equivalent.

Most of the work samples are relatively simple to administer, once the evaluator becomes sufficiently familiar with them. Tne taped instructions themselves provide subtle directions to the evaluator to insure smooth administration; for example, at appropriate places the tape will say, "Now the evaluator will distribute the diagrams." In addition, each work sample includes a separate manual with detailed instructions for the evaluator, as well as a copy of the instructions to the client. Scoring is objective and the procedures described in detail.

While formal training is not mandatory, training programs are available through ICD. Training is free to purchasers of the entire system, but the agency must pay travel, room and board expenses. Consulting services will also be provided for a fee. Information is available upon request.

TESTING MATERIALS REQUIRED

All materials needed to administer the thirteen work samples are provided with the Micro-TOWER kit. This includes a cue-stop tape player, cassette tapes, two table easels, and photobooks for illustrating the work sample tasks and showing the occupational photos. Consumable materials consist only of printed materials, much of which can be reproduced for local use, and the lamp cord used in Lamp Assembly. This cord needs to be replaced after 18-20 administrations. All replacement items are available from ICD; specifications for those items which can be purchased locally will be provided. Equipment is of high quality and durable. The only mechanical equipment is the cue-stop tape player which comes with a one year guarantee on parts and service. If repairs are needed an ordinary tape player can be used temporarily with manual operation.

COST

The actual cost of a Micro-TOWER system varies according to the number of clients to be tested per group. The reason for this is that each client must have a set of equipment. Thus, if seven clients are to be given the Graphics Illustration work sample, each would require a drafting board and a set of tools. An additional set is also supplied for the evaluator for the purposes of demonstration. To test seven clients a purchaser would really be getting 91 work samples (13 x 7), plus 13 additional ones for the evaluator. The following figures are provided to give an idea of the possible price range: To test a group of 5 clients, the price of a system is $5,180; for 7 clients, $6,015; for 10 clients, $7,207. This includes insurance and shipping charges within the United States. The price also includes the cue-stop tape player, cassette tapes, photobooks,, easels, and manuals. No charge is made for the training course, although purchasers must bear expenses for travel, room and board. Also included in the purchase of a complete Micro-TOWER system is the computation of local norms for a maximum of 100 clients.

Although it is highly recommended that the entire system be used, it is recognized that certain agencies may wish to order a limited number of work samples. A separate price list is available. Those ordering individual work samples are not eligible for the free complimentary training course nor for the computation of local norms.

SPACE REQUIREMENTS

To insure the best possible testing environment, Micro-TOWER should be administered in a room free from distractions and interruptions. This insures that clients have the best situation in which to demonstrate their skills, and that their scores will not be influenced by extraneous factors. Some persons argue that a workshop environment best resembles a real job situation and should be used for work evaluation. In some situations this may be true. But when you are trying to objectively assess the client's aptitudes, this should be done under optimal conditions to allow clients to work to their maximum potential. Interruptions and distractions, although realistic, may influence scores in unknown ways; invalid, unreliable scores may result. A client's concentration and other work habits can still be observed, but in more controlled circumstances.

For Micro-TOWER, a room should have table space of approximately 24" x 30" for each client; all work samples are given in a seated position so a chair is needed for each client. The evaluator will also need a table for the tape recorder and for the photobook easels. A room about 225 square feet should be adequate for evaluating six to seven clients.

Reliability

One of the benefits of using a standardized test or work sample is that it readily lends itself to research. When Micro-TOWER is administered according to the standardized instructions and the work samples are scored according to the objective standards, reliable results can be expected.

The Technical Manual provides data on the reliability of the Micro-TOWER work samples. The coefficients range from .74 to .97. The data were based on test-retest, alternate forms, and internal consistency estimates using the Kuder Richardson Formula 20. These reliability coefficients are as high as those obtained by many of the best paper and pencil tests, and much higher than those that would be expected from work samples that allow more subjectivty into the evaluation. One can expect this means a respectable amount of consistency when administering Micro-TOWER. Whatever the work samples are measuring, they seem to be measuring with a minimal amount of random or measurement error.

Standard errors of measurement are reported as well, and are included on the profile sheets. Instructions are provided in the manual for those wishing to use the standard errors to establish "confidence bands" around the clients raw scores. This provides a probable range for the client's performance, and reduces the tendency to give too much emphasis to a given score.

Validity

Conducting validity studies with any test presents many problems; for work samples the problems are even greater. One of the reasons is that work samples take a much longer period of time and cooperation of subjects is often more difficult to obtain.

The kinds of validity studies to be conducted depend upon the decisions that are to be made. As Micro-TOWER is an aptitude battery primarily intended for screening for further evaluation or training, validity studies should provide data to support decision-making in these areas.

Examination of the specific tasks involved in the work samples provides some evidence of the content validity of these work samples, that is that they are measuring the aptitudes that they were designed to measure. A factor analysis revealed, as expected, a large general factor, but also provided evidence for grouping the work samples into the five aptitude areas.

The construct validity of the work sample battery was also supported by examination of the intercorrelations of the Micro-TOWER work samples. Correlations were also available with the factors from the GATB. These data are reported in The Technical Manual.

Predictive validity studies for predicting success in given training programs have yet to be conducted. Results will be shared with users as they become available. One related study providing positive evidence of Micro-TOWER's use in decision-making compared the recommendations made after a one week evaluation with Micro-TOWER to the recommendations made after four more additional weeks in TOWER. There was a 74% agreement on vocational recommendations, suggesting that decisions can be reached in a much shorter time

for many individuals. There will always, of course, be those individuals that will need a longer more intensive evaluation; for those persons the individually administered work samples can then be used.

There is some question as to whether or not the level of the Micro-TOWER work samples is high enough to allow for prediction of successful employment. Even if it were possible to obtain sufficiently large numbers of employees or applicants for specific jobs, the narrow range in which these persons would be expected to perform would probably result in useless data. Using a pool of so-called normal people also does not solve any problems, as clients are not being evaluated to see how "normal" they are in general. Different occupations require different aptitudes at different levels, and working with a general population would not provide the necessary information for decision-making.

Also, time motion studies (MTM's, Modapts, etc.) do not seem appropriate for the Micro-TOWER work samples. These types of analysis are primarily for repetitive motor tasks. A few of the Micro-TOWER samples do involve some repetitive motion, but one MTM consultant stated that the length of time for the Micro-TOWER evaluations was not sufficient for determining MTM standards.

Despite the above qualifications, attempts are being made to do validity studies with workers; attempts are being made to locate cooperative businessess to help with the conducting of validity studies. Union concerns, fear of problems involving equal employment opportunity, and staff time seem to make employers hestitant to cooperate. Also lack of sufficient numbers (minimum 30) in any given job provides some problem.

COMPARISON OF MICRO-TOWER TO OTHER AVAILABLE WORK SAMPLE SYSTEMS

The evaluation unit at ICD uses not only TOWER, but some of the JEVS, Singer-Graflex, and Valpar units. In addition, many of the field sites were using other work samples in conjunction with Micro-TOWER and feedback on the interrelationships of the systems was obtained. More extensive studies need to be conducted; however, the preliminary reports and impressions will be shared here.

Micro-TOWER was designed so that it could stand alone as the only evaluation system, if necessary. Some field sites used it this way as they had limited staff, limited funds, and a limited time to assess clients. As a Micro-TOWER evaluation can be completed in two to five days this seemed to suit their needs. Micro-TOWER is also useful when short term evaluations are part of an agency's program, such as initial evaluations for insurance companies or RIDAC programs.

One of the most common uses of Micro-TOWER is as a screening device for the other work sample systems. Many agencies seem to have components from more than one system. As Micro-TOWER is a general aptitude battery, geared to the average performance level of clients, it makes a very good screening device. A client's performance on Micro-TOWER can indicate which areas need further evaluation. This further evaluation can be conducted with the other systems. The presentation of occupational information and the group discussions also help focus the clients' interests in certain vocational areas. Information gained from the Micro-TOWER discussions can also be used to determine in which areas a client would like further evaluation.

None of the other work sample systems to date are given in a group situation, as in Micro-TOWER. Group evaluation provides very important observational data on how well clients interact with others and with a supervisor. Most clients will be working in a social context, and

group behaviors are extremely important to observe. Group and individual performance are not always the same. Some clients need the supportive environment of the group. Others work best alone. Some will act out in a group, yet work well alone. Some do well in both situations. For proper job placement clients who cannot work well in group situations may have difficulty in training programs. For proper job placement both group and individual work habits should be observed.

The cost of Micro-TOWER is another positive factor. Although it looks as if it is competitively priced, one actually receives much more equipment than with other systems. As indicated earlier, for a system sufficient to test seven clients the cost is $7,207. This, however, includes a total of 104 work sample units (13 work samples x 7 clients, plus one each for the evaluator). Training is not required, so staff time need not be lost if an agency cannot afford to release staff.

One of the possible limitations of Micro-TOWER in a rehabilitation setting is that traditionally most evaluation units have been set up for the individually administered work samples. The evaluator moves from client to client, the evaluator can go to meetings, make phone calls, do some paper work while the evaluation is going on. Micro-TOWER requires the evaluator to be present with the group at all times. This provides more opportunities for behavioral observations and immediate support and reinforcement for clients who may be having difficulties. However, this approach may require some reorganization of staff in traditional evaluation units. This involves administrative decisions and inservice education and training. The problem does not exist in school settings where evaluation has traditionally been geared toward the group or classroom approach.

Once agencies incorporate the group into their organization many evaluators enjoy having the privacy and complete involvement with the clients. The wealth of information provided from the intensive evaluation makes report writing much easier and more meaningful. Where sufficient staff exists, however, it is often advisable to use more than one evaluator for Micro-TOWER, so that staff will have a variety of experiences working with both individual and group systems. Evaluators can alternate weeks or can share in a weeks evaluation, writing the reports jointly.

The addition of any new work samples can involve problems of space and security of equipment. If the present evaluation unit is large enough, some work samples systems can be added without too much problem. Micro-TOWER, however, should be administered in a separate room that is free from distractions and interruptions; this is because it is a standardized system and because some of the work samples are timed. Usually a reevaluation of current space usage turns up a room suitable for Micro-TOWER evaluation.

Since prediction with Micro-TOWER is mainly for further evaluation or job training, validity studies will be conducted in these areas. Written reports on the correlations with the TOWER and JEVS work sample systems are being prepared for publication.

In the interim, counselors and evaluators wishing to make decisions regarding possible areas for which clients might be trained or jobs in which they might be placed can refer to the worker trait groups in the DOT. The relationship of Micro-TOWER to the DOT has been discussed earlier in this paper under uses of Micro-TOWER.